Before the

# Federal Communications Commission

Washington, D.C. 20554

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| In the Matter of | ) | |
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| AMENDMENT OF PART 97 OF THE | ) | |
| COMMISSION'S RULES GOVERNING THE | ) | RM-11306 |
| AMATEUR RADIO SERVICE Concerning | ) | |
| Permitted Emissions and Control Requirements | ) | |

To: The Chief, Wireless Telecommunications Bureau

## Comments in Opposition to the Notice of Oral Ex-Parte Presentation RM-11306 and Erratum

**1.** I Mark Miller Amateur Radio Operator N5RFX respectfully submit comments to the written ex-parte filing made by the ARRL on February 14, 2007 with respect to the above Petition for Rule Making and the Erratum submitted on March 22, 2007. In the oral ex-parte presentation, the ARRL proposes changes to the requirements for automatically controlled stations transmitting RTTY or data emission found in 97.221. The ARRL proposes lifting the current frequency subbands provided for mitigating interference that is inherent to unattended operation in the H.F. (high frequency bands). The commission has set aside specific subbands for use by automatically controlled stations[1] in the Report and Order adopted April 17, 1995.[2] At that time the only emissions found in the

[1] 47 CFR 97.3(a)(6) The use of devices and procedures for control of a station when it is transmitting so that compliance with the FCC Rules is achieved without the control operator being present at a control point.

[2] FCC 95-163 PR Docket 94-59

RTTY/Data subbands were CW, RTTY.AMTOR, and PACTOR. Since 1995, the availability of personal computer sound cards and their flexibility in producing new emissions has increased the use of this spectrum. At the same time there has been a decrease in the use of AMTOR and PACTOR in traditional Amateur radio operations, with Pactor III being used nearly exclusively by digital stations under automatic control. The subbands set aside for use by automatically controlled stations are seeing increases in activity with newly developed modes that are not automatically controlled. When the Report and Order, FCC 95-163 was adopted, the Commission challenged the Amateur radio community to minimize interference with novel technical and operational approaches to the use of shared frequency bands[3]. To date, there have been no technical innovations to minimize interference. Quite the opposite has taken place. The primary emission for automatically controlled stations uses multiple bandwidth emissions during operation. During optimal conditions, the bandwidth increases from 500 Hz to 2.2 kHz without determining if the wider spectrum is occupied. The prevailing attitude has become "With NO channelization on the Amateur bands, anyone who purposely puts themselves into the Part 97.221 frequency range, expecting silence, is unaware of the purpose of the sub-band." The algorithms and attitudes of this small group are contrary to the accepted methods of spectrum sharing used by Amateur radio operators.

**2.** The ARRL also proposes to enumerate a 3 kHz maximum bandwidth in the RTTY/Data subbands. Two bandwidths are appropriate for what is now the RTTY/Data subband, 1.5 KHz and 2.4 kHz. The selection of these two

[3] FCC 95-163 PR Docket 94-59 paragraph 6.

bandwidths should accommodate current modes and not prohibit any emissions currently found in the 80 through 10-meter bands. Pactor III would continue to be authorized, as long as speed levels 1 and 2 are used.[4] 1.5 kHz is appropriate because of the bandwidth guidance for the RTTY/Data subbands in 97.307(f)(3). When employing the formulae of Part 2.202 for amplitude or frequency modulation, with a signal with quantized or digital information, and telegraphy without error-correction, the necessary bandwidth derived is 1.5 kHz. 1.5 kHz will accommodate emissions in the RTTY/Data subbands where appropriate and is consistent with the intention of 97.307(f)(3). 2.4 kHz is also appropriate because of the bandwidth guidance for the RTTY/Data subbands in 97.307(f)(4). 1.5 kHz bandwidth is appropriate for the 80 through 12 meter bands and 2.4 kHz is appropriate for the 10-meter band. This action will restore the separation of emissions by bandwidth, which has been lost due to changes in technology. Since the time that 97.307(f)(3) and 97.307(f)(4) were written, phase shift keying emissions have become available to Amateur radio operators because of the proliferation of digital signal processors[5]. These allow generation of parallel PSK signals that were not possible with hardware within the reach of Amateur radio operators in 1988.[6] This change in technology puts in question the definition of

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[4] Speed levels 1 and 2 are independent sub-protocols with distinct modulation and channel coding

[5] a special type of coprocessor designed for performing the mathematics involved in manipulating analog information. Personal computer sound cards are an example of a digital signal processor.

[6] an example is Orthogonal frequency-division multiplexing (OFDM), a method of digital modulation in which a signal is split into several narrowband channels at different frequencies.

symbol, which is the basic unit of measure when using Baud[7], and it also puts into question the use of shift. 97.307(f)(3) and 97.307(f)(4) have served the amateur radio community well over the years, but can no longer be the recommendation for maximum bandwidth because of changes in emissions due to technology changes. 97.307(f)(3) and 97.307(f)(4) no longer provide the separation of certain inharmonious emission types to different segments of the frequency bands. An example of a wideband emission found in the RTTY/Data subbands is PACTOR III. PACTOR III is designed specifically for the commercial market to provide higher throughput and improved robustness utilizing a complete SSB channel of 2.2 kHz. Up to 18 tones are used in optimum propagation conditions, spaced at 120 Hz.[8] The bandwidth of this commercial protocol is authorized today because the feeling among the Pactor III operators is that 97.307(f)(3) does not apply to Pactor III because of the meaning of Baud, Symbol and shift are in question. The physical data rate on all PACTOR III speed levels is 100 baud, but many Amateur radio operators feel that traditional bandwidth limits have been exceeded because parallel tones are being transmitted which circumvent the intention and spirit of 97.307(f)(3). During optimal conditions the bandwidth is 2.2 kHz, this is contrary to the accepted methods of spectrum sharing used by Amateur radio operators. When band conditions are optimal, more stations appear on the bands and bandwidth should be conserved. In the commercial services, such as those found in parts 80 and

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[7] Baud is symbols per second.. A symbol is a unique state of a channel, it may be the phase or frequency of a carrier. The question with OFDM is what constitutes a symbol?

[8] The PACTOR-III Protocol Technical Description by Hans-Peter Helfert and Thomas Rink SCS GmbH & Co. KG, Hanau, Germany. See appendix B.

90 of the Commission's rules, this type of emission would be acceptable due to the fact that these services are channelized. Because of the necessary bandwidth and protocol used to determine bandwidth, Pactor III is inharmonious and incompatible with the accepted operating principles of Amateur radio on the HF bands. Since the principal use of emission designators in regulations for the Amateur radio service is to relegate the transmission of certain inharmonious emission types to different segments of the frequency bands and separation of emission types by bandwidth is accepted in the amateur service as a reasonable means to minimize interference on shared frequencies, the ARRL recommendation of 3 kHz is not appropriate and should be reduced.

**3.** In conclusion, deleting the requirement for automatically controlled digital stations to operate in certain subbands, will increase the interference among stations using digital communications, thereby degrading the overall use of the spectrum for all licensees. Technology has changed the way that we look at bandwidths. The ARRL recommended enumerated bandwidth of 3 kHz does not provide the separation of certain inharmonious emission types to different segments of the frequency bands. Adding a maximum enumerated bandwidth in the RTTY/Data subbands is appropriate but needs to provide separation of wide and narrow bandwidth modes. I respectfully ask the Commission to dismiss RM-11306, the conclusions and recommendations of the oral ex-parte presentation to include the referenced errata.

Respectfully yours,
Mark D. Miller

Amateur Radio Operator N5RFX
5612 Trail Crest Dr.
Arlington, TX 76017
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